

56. (New) The method of claim 55, further comprising generating a playlist, said playlist including said music sample if said sample proximity is smaller than a desired proximity.

### REMARKS

Claims 1-17, 19-31, and 33-56 are pending after the amendment. Claims 1-17 and 19-32 were pending in the application. Claims 1-10, 13-17, 19-31 have been amended. Claim 32 has been deleted. Claims 33-56 have been added.

#### Rejections under 35 U.S.C. 102(a)

The Examiner rejected claims 1-17 and 19-32 under 35 U.S.C. 102(a) as anticipated by U.S. Patent Number 5,918,303 to Yamaura et al. ("Yamaura") and U.S. Patent Number 5,969,283 to Looney et al. ("Looney"). Applicants have amended the claims and respectfully traverse the rejections.

Claim 1 sets forth a plurality of feature vectors including a first feature vector, where the first feature vector includes "a first component and a second component, said first and second components each having more than two possible values." That is, the first feature vector has a true vector nature. As such, the first feature vector of claim 1 allows much more extensive searching for music based on content than existing music searching techniques such as those taught in Yamaura and Looney. Neither Yamaura nor Looney teach or suggest a first feature vector as set forth in claim 1.

The Examiner stated that Yamaura and Looney "each discloses a user entering search parameters such as title, artist, speed, tempo, dance characteristic, style, genre, tone color, and voice to generate a play list. These parameters are compared with corresponding categories of music corresponding to feature vectors or music attributes." (See page 2 of the Office Action).

However, claim 1 as amended sets forth that the plurality of feature vectors includes a first feature vector, where the first feature vector includes "a first component and a second component, said first and second components each having more than two possible values." Since the parameters of Yamaura and Looney do not have at least two components, where each component has more than two possible values, they do not correspond to feature vectors.

Instead, Yamaura describes performance setting data which includes the tune name, artist number, composer number, genre number, style number, tempo value, harmony number, and tone color number (see Figure 15 of Yamaura). None of Yamaura's performance setting data is a feature vector with at least two components, each component having more than two possible values.

Similarly, Looney teaches a music organizer and entertainment center that enables customized playback of music having a variety of predetermined categories (see column 1, lines 65-67 of Looney). Looney's categories include a variety of parameters such as title, artists, date, speed, dance characteristics, energy level and music style (see column 2, lines 16-18 of Looney). However, none of Looney's categories is a feature vector with at least two components, each component having more than two possible values.

For an illustration, which is not intended to limit the invention as claimed, assume that the first feature vector of claim 1 is a genre vector. Yamaura includes style number as one type of performance setting data. Similarly, one of Looney's categories is music style. However, both Yamaura and Looney teach that the chosen style be a single style. In contrast, under claim 1, the genre vector (as the first feature vector) would have at least two components, each of which has more than two possible values. Assume for this example that the genre vector has four components: blues, rock and roll, classical, and jazz. Then, for a song (a music sample) that is predominantly jazz but also has elements of the blues, the genre vector would have a large jazz component, a smaller blues component, and zero rock and roll and classical components. Thus, a system for searching music as described in claim 1 allows more comprehensive searching than the systems of Yamaura and Looney, which would classify the song as only jazz.

Since neither Yamaura nor Looney teaches or suggests a first feature vector as set forth in claim 1, claim 1 is patentable over both references.

Claim 15 sets forth a plurality of feature vectors including a first feature vector, where the first feature vector includes "a first component and a second component, said first and second components each having more than two possible values." Therefore, for at least the same reasons as stated above with regard to claim 1, independent claim 15 is patentable over both references.

Claim 20 sets forth a plurality of feature vectors including a first feature vector, where the first feature vector includes "a first component a second component, said first and second components each having more than two possible values." Therefore, for at least the same

reasons as stated above with regard to claim 1, independent claim 20 is patentable over both references.

Claims 2-14 depend from claim 1 and therefore are patentable for at least the same reasons as stated above with respect to claim 1. Claims 16, 17, and 19 depend from claim 15 and therefore are patentable for at least the same reasons as stated above with respect to claim 15. Claims 21-31 depend from claim 20 and therefore are patentable for at least the same reasons as stated above with respect to claim 20.

New claims 33-56

New claims 33-56 have been added. New claims 33-56 introduce no new matter and are fully supported in the specification as filed.


CONCLUSION

For the above reasons, claims 1-17, 19-31, and 33-56 are now in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the examiner is requested to telephone the undersigned.

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ATTACHMENT A

1. (Three Times Amended) A system for searching music comprising:  
a music sample location within a combined music space, said music sample location defined by a plurality of feature vectors [including values defining]including a first feature vector, each of said feature vectors representing a perceived music attribute[s] of a music sample, [each of said plurality of feature vectors defining a location of said music sample within a music space], said first feature vector including a first component and a second component, said first and second components each having more than two possible values; [and]

a user request music location within said combined music space, said user request music location defined by search parameters, where said search parameters represent desired music attributes; and

an inferential engine for comparing said [plurality of feature vector defined locations of plural music samples to determine a spatial proximity to a reference location defined by user entered search parameters from which to generate a playlist for said user] user request music location to said music sample location and determining a sample proximity between said user request music location and said music sample location.

2. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises an emotional quality vector [describing the emotional reaction to music,]; said first component of said emotional quality vector representing the degree to which a first emotion is evoked by said music sample and said second component of said emotional quality vector representing the degree to which a second emotion is evoked by said music sample.[ based upon whether music is Intense, Happy, Sad, Mellow, Romantic, Heartbreaking, Aggressive, or other emotions.]

3. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises a vocal quality vector; said first component of said vocal quality vector representing the degree to which a first vocal quality parameter is present in said music sample and said second component of said vocal quality vector representing the degree to which a second vocal quality parameter is present in said music

sample. [describing the vocal quality of music, based upon whether music includes a Smooth voice, a Powerful voice, a Great voice, a Soulful voice, or other voice qualities.]

4. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises a sound quality vector; said first component of said sound quality vector representing the degree to which a first sound quality parameter is present in said music sample and said second component of said sound quality vector representing the degree to which a second sound quality parameter is present in said music sample. [describing the sound quality of music, based upon whether music includes a Strong beat, or is simple, or has a good groove, or is fast, or is speech like, or emphasizes a melody, or other sound qualities.]

5. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises a situational quality vector; said first component of said situational quality vector representing the degree to which said music sample would be desirable in a first situation and said second component of said situational quality vector representing the degree to which said music sample would be desirable in a second situation. [describing the plural situations for which the music may be used, based on whether the music is, good for a workout, a shopping mall, a dinner party, a dance party, for slow dancing, or for studying or other situations.]

6. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises a genre vector; said first component of said genre vector representing the degree to which a first music genre is present in said music sample and said second component of said genre vector representing the degree to which a second music genre is present in said music sample. [describing the music genre, based on whether the music is belongs to a plurality of genres including, Alternative, Blues, Country, Electronic/Dance, Folk, Gospel, Jazz, Latin, New Age, R&B, Soul, Rap, Hip-Hop, Reggae, Rock or others.]

7. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises an ensemble vector; said first component of said ensemble vector representing the extent to which a first ensemble type is present in said

music sample and said second component of said ensemble vector representing the extent to which a second ensemble type is present in said music sample. [describing the music ensemble, based on whether the music includes a female solo, male solo, female duet, male duet, mixed duet, female group, male group or instrumental.]

8. (Twice Amended) The system of Claim 1, wherein [one of said plurality of feature vectors] said first feature vector comprises an instrument vector, said first component of said instrument vector representing the importance of a first instrument in said music sample and said second component of said instrument vector representing the importance of a second instrument in said music sample. [describing the music instruments, based on whether the music includes a includes an acoustic guitar, electric guitar, bass, drums, harmonica, organ, piano, synthesizer, horn, or saxophone or other instruments.]

9. (Twice Amended) The system of Claim 1, further comprising a plurality of input mixers for allowing [said] a user to dynamically update said search parameters.

10. (Twice Amended) The system of Claim 9, wherein one of said plurality of input mixers [comprises input mixers taken from] is selected from the group consisting of a genre mixer, a voice quality mixer, an emotional quality mixer, an instrument mixer and a sound quality mixer.

13. (Twice Amended) The system of Claim 1, further comprising a first music sample and a second music sample, wherein said inferential engine comprises a modeling module for performing a similarity analysis to determine a function for representing the similarity between said [plural music samples] first music sample and said second music sample.

14. (Twice Amended) The system of Claim 1, wherein each of said plurality of feature vectors [are] is formulated using responses to a plurality of questions asked of a plurality of music listeners after said plurality of music listeners are played [a plurality of music samples] said music sample.

15. (Three Times Amended) A system for searching music based upon music content, comprising:

a user interface for receiving a user request for a music playlist, said user request [being formulated into a search vector value which defines a reference location] including search parameters, where said search parameters represent desired music attributes, said search parameters defining a user request music location in a combined music space;

a plurality of [feature vectors defining feature vector values corresponding to perceived attributes of music, each of said plurality of feature vectors defining a location of a music sample within a music space] music sample locations within a combined music space, each of said music sample locations defined by a plurality of feature vectors including a first feature vector, where each of said plurality of feature vectors represents a perceived music attribute of one of a plurality of music samples and where said first feature vector includes a first component and a second component, said first and second components each having more than two possible values; and

an inferential search engine [for generating a playlist of selected music, said music selection being made by determining a spatial separation in said music space between each of said feature vector defined locations and said reference location, said playlist including music samples determined to have a preselected range of spatial separation in said music space from said reference location] configured to determine a sample proximity for each of said music samples, where said sample proximity is determined by comparing said user request music location to said music sample location.

16. (Twice Amended) The system of Claim 15, wherein said user interface comprises a parser for parsing [the] said user request[s], wherein the parser is a XML parser.

17. (Twice Amended) The system of Claim 15, wherein [the] said user request comprises standard query language (SQL) calls.

19. (Three Times Amended) The system of Claim 15, further comprising:

a modeling module for creating a similarity music space, said similarity music space including a music pair location, said music pair location representing the perceived similarity of one of said plurality of music samples to another of said plurality of music samples.[ by performing a similarity analysis of said feature vector values, said similarity analysis

establishing a boundary for said similarity music space, said feature vector values indicating a location for said music within said similarity music space wherein said modeling module determines the proximity of said music locations to said reference location within said similarity music space.]

20. (Twice Amended) A system for creating a music space, comprising:  
a plurality of feature vectors, each of said plurality of feature vectors representing a perceived music attribute of a music sample, each of said plurality of feature vectors defining a location of said music sample within a music space, each of said plurality of feature vectors including a first component a second component, said first and second components each having more than two possible values; [defined by a first set of music attributes allocated to a music piece;] and  
a modeling module which creates a plurality of music spaces by performing a similarity analysis of said feature vectors, said similarity analysis establishing boundaries for said music spaces.

21. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises an emotional quality vector [describing the emotional reaction to music,]; said first component of said emotional quality vector representing the degree to which a first emotion is evoked by said music sample and said second component of said emotional quality vector representing the degree to which a second emotion is evoked by said music sample. [based upon whether music is Intense, Happy, Sad, Mellow, Romantic, Heartbreaking, Aggressive, or other emotions.]

22. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises a vocal quality vector, said first component of said vocal quality vector representing the degree to which a first vocal quality parameter is present in said music sample and said second component of said vocal quality vector representing the degree to which a second vocal quality parameter is present in said music sample. [describing the vocal quality of music, based upon whether music includes a Smooth voice, a Powerful voice, a Great voice, a Soulful voice, or other voice qualities.]



23. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises a sound quality vector; said first component of said sound quality vector representing the degree to which a first sound quality parameter is present in said music sample and said second component of said sound quality vector representing the degree to which a second sound quality parameter is present in said music sample. [describing the sound quality of music, based upon whether music includes a Strong beat, or is simple, or has a good groove, or is fast, or is speech like, or emphasizes a melody, or other sound qualities.]

24. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises a situational quality vector; said first component of said situational quality vector representing the degree to which said music sample would be desirable in a first situation and said second component of said situational quality vector representing the degree to which said music sample would be desirable in a second situation. [describing the plural situations for which the music may be used, based on whether the music is, good for a workout, a shopping mall, a dinner party, a dance party, for slow dancing, or for studying or other situations.]

25. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises a genre vector, said first component of said genre vector representing the degree to which a first music genre is present in said music sample and said second component of said genre vector representing the degree to which a second music genre is present in said music sample. [describing the music genre, based on whether the music is belongs to a plurality of genres including, Alternative, Blues, Country, Electronic/Dance, Folk, Gospel, Jazz, Latin, New Age, R&B, Soul, Rap, Hip-Hop, Reggae, Rock or others.]

26. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises an ensemble vector, said first component of said ensemble vector representing the extent to which a first ensemble type is present in said music sample and said second component of said ensemble vector representing the extent to which a second ensemble type is present in said music sample. [describing the music ensemble, based on whether the music includes a female solo, male solo, female duet, male duet, mixed duet, female group, male group or instrumental.]

27. (Twice Amended) The system of Claim 20, wherein one of said plurality of feature vectors comprises an instrument vector, said first component of said instrument vector representing the importance of a first instrument in said music sample and said second component of said instrument vector representing the importance of a second instrument in said music sample. [describing the music instruments, based on whether the music includes a includes an acoustic guitar, electric guitar, bass, drums, harmonica, organ, piano, synthesizer, horn, or saxophone or other instruments.]

28. (Twice Amended) The system of Claim 20, wherein said plurality of music spaces are combined to define a combined music space and wherein said plurality of feature vectors define a music sample location of said music sample within said combined music space.

29. (Amended) The system of Claim 28, wherein said plurality of feature vectors comprises at least two feature vectors taken from the group consisting of an emotional quality vector, a vocal quality vector, a sound quality vector, an ensemble quality vector, a genre vector, an instrument vector, and a situational vector, and wherein said combined music space comprises music spaces corresponding to said at least two feature vectors.

30. (Amended) The system of Claim 28, said combined music space further comprising a cluster space, wherein said music sample is included in a cluster if said music sample location is within said cluster space. [piece is assigned a first location in said combined music space proximate to a second locations assigned to a second music piece having a second plurality of feature vectors defined by similar by a second set of music attributes similar to said first set, said first and said second locations forming a cluster.]

31. (Amended) The system of Claim 20, wherein said plurality of feature vectors are each formulated using responses to a plurality of questions asked of a plurality of music listeners after said plurality of music listeners are played [a plurality of] one or more music samples.

## ATTACHMENT B

The paragraph starting on page 8, line 15 is amended as follows:

Another advantage of the present invention is that since the feature vectors define music attributes, music can be searched based upon music content.

The paragraph starting on page 24, line 14 is amended as follows:

Internet harvesting may be also used to collect Internet harvested or "Spider data" 403E. Spiders are well known and collect data of users that browse the Internet. A similar strategy to that of radio logging can be applied for Internet harvesting. Co-occurrence analysis can be carried out on a plurality of web pages. One approach would involve computing the frequency of co-occurrence of artist names on a large sample of web pages. Those artists with higher frequencies of co-occurrence are more likely to have features in common than artists with lower frequencies of co-occurrence. A similar analysis can be conducted for music titles, for albums and music labels etc.

The paragraph beginning on line page 32, line 19 is amended as follows:

(c) Sound quality vector: A vector based on the [vocal] sound quality of a particular music sample, for example, whether a music sample has a:

Strong beat

Is Simple

Has a good Groove

Is Fast

Is speech like

Emphasizes a melody

The paragraph beginning on page 33, line 20 is amended as follows:

[Vocal] Situational quality vector values are based upon listener response to questions 700D (Figure 7A2). The foregoing examples and the questions in 700D are merely illustrative and are not intended to limit the scope of the invention. As discussed below, situational quality vector is used to define a [sound] situational quality space.

The paragraph beginning on page 46, line 3 is amended as follows:

[(b)] (e) Fuzzy Queries: Techniques provided in "An Introduction to Fuzzy Logic Applications in Intelligent Systems" by R. R. Yager & Lotfi A. Zadeh. (1992), published by Kluwer Academic Publishers, and incorporated herein by reference in their entirety, may also be used to calculate the foregoing weights and perform the similarity analysis. Fuzzy techniques essentially place graded or "soft" constraints on matching criteria rather than on "hard" or Boolean constraints. A fuzzy approach is essentially one in which the degree to which one piece of music is similar to another piece of music follows a continuous or graded function.

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